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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/517,298

12/07/2004

Takanori Fukushima

TSUZ 2 00019

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7590

04/18/2007

FAY SHARPE LLP

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CLEVELAND, OH 44114

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT

PAPER NUMBER

1751

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/18/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/517,298

Applicant(s)

FUKUSHIMA ET AL.

Examiner

Kallambella Vijayakumar

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### DETAILED ACTION

- This application is a 371 of PCT/JP03/13162 filed 10/15/2003. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
- Claims 1-5 are currently pending with the application.

### *Specification*

The abstract of the disclosure is objected to because it contains two paragraphs. Correction is required. See MPEP § 608.01(b).

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by Tennet et al (US 6,099,965).

The prior art teaches an activated aerogel composition comprising a polymer of resorcinol and formaldehyde, oxidized Hyperion CC-fibrils and 0.2M Na<sub>2</sub>CO<sub>3</sub> (Ionic Liquid) (CI-26-27, Ex-18). Na<sub>2</sub>CO<sub>3</sub>

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with a melting point of 891°C meets the limitation of ionic liquid, because applicants define ionic liquid to be "a salt which assumes a molten state in a wide range of temperatures including ordinary temperature (room temperature)" (Spec. Pg-4, Last Line and bridging line in Pg-5). All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang et al (US 6,110,619).

Zhang et al teaches the composition of a cathode comprising a gel containing an electroactive sulfur compound, a cationic polymer comprising quaternary ammonium salts <ionic liquid> such as poly(diallyldimethyl ammonium) salts and copolymer salts of diallyldimethylammonium and acrylamide and a conductive material of carbon nanofibers <nanotube> forming a gel-like electrode. With regard to the method step in claim-3, the prior art teaches mixing the components by suitable means such as grinding and ball milling (pulverizing by applying shear force). All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 1-4 are rejected under 35 U.S.C. 102(a) as being anticipated by Fukushima et al (Science, 2003, 300, pp 2072-2074).

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Fukushima et al teach a gel composition containing a dispersion of SWNT in organic molten salts <ionic liquid> and a method of making it by grinding the components in an agate mortar and separating the excess fluid by centrifugation (Title, Abstract, Pg-2072, Cl-2, Para-3; Fig-4). All the limitations of the instant claims are met.

The reference is anticipatory.

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***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tennet et al (US 6,099,965) in view of Smalley et al (US 2002/0046872).

The disclosure by Tennet et al as set forth in rejection-1 under 35 USC 102(b) is herein incorporated. The prior art teaches mixing the resorcinol, formaldehyde and carbon fibrils by ultrasonic and then mixing with sodium carbonate.

The prior art fails to teach a composition containing SWNT per claim-2 and silent about pulverizing the mixture under shear per claim-3.

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In the analogous art, Smalley et al teach forming teach polymer wrapped SWNT, suspensions of SWNT and polymer composites with SWNT including gels, by mixing the SWNT with the polymer and sodium chloride <ionic liquid> using an ultrasonic or high-shear mixer followed by purifying the composition by centrifugation, and then forming a gel by centrifugation of the polymer/SWNT mixture (Abstract; Para 0047, 0053; 0059, 0061 and 0063-64, Claim-4).

With regard to claim-2, It would be obvious to a person of ordinary skilled in the art to substitute the carbon nanofibers in the composition of Tennet et al with SWNT of Smalley as functional equivalent with reasonable expectation of success, because the combined prior art is suggestive of the claimed composition, and have common utility of nanotubes as catalysts (Tennet: CI-1, Ln 18-22; Smalley: P-0017).

With regard to claim-3, It would be obvious to a person of ordinary skilled in the art to mix the sodium carbonate with the fibril with ultrasonic to attain a uniform dispersion. The ultrasonic meets the limitation of shear mixing and disintegrating the fibril clusters forming a uniform dispersion (Pulversizing).

With regard to claim-4, It would be obvious to a person of ordinary skilled in the art to purify the composition by centrifugation with reasonable expectation of success, because the combined prior art is suggestive of the claimed method step, and have common utility of nanotubes as catalyst supports and purity of a catalyst material is known to a person of ordinary skilled in the art at the time of disclosure of the invention by the applicants (Tennet: CI-1, Ln 18-22; Smalley: P-0017).

With regard to claim-5, the prior art teaches pouring the components in to a vial forming a desired shape by subjecting it to external force of gravity <injection/dispense>, and washing the gel by contacting it with water (solvent) to remove the sodium carbonate (ionic liquid).

2. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (US 6,110,619) in view of Smalley et al (US 2002/0046872).

The disclosure by Zhang et al as set forth in rejection-2 under 35 USC 102(b) is herein incorporated.

The prior art is fails to teach a composition containing SWNT per claim-2, and subjecting the gel to centrifugal treatment per the claim-4.

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In the analogous art, Smalley et al teach forming teach polymer wrapped SWNT, suspensions of SWNT and polymer composites with SWNT including gels, by mixing the SWNT with the polymer and sodium chloride <ionic liquid> using an ultrasonic or high-shear mixer followed by purifying the composition by centrifugation, and then forming the gel by centrifugation of the polymer/SWNT mixture (Abstract; Para 0047, 0053; 0059, 0061 and 0063-64, Claim-4).

With regard to claim-2, It would be obvious to a person of ordinary skilled in the art to substitute the carbon nanofibers in the composition of Zhang et al with SWNT of Smalley as functional equivalent with reasonable expectation of success, because the combined prior art is suggestive of the claimed composition, and have common utility of nanotubes in electrochemical cells that include fuel cells (Zhang: Title; Smalley: P-0017).

With regard to claim-4, It would be obvious to a person of ordinary skilled in the art to separate the excess liquid from the gel composition by methods such as centrifugal separation known to a person of ordinary skilled in the art at the time of the disclosure of the invention (Smalley: P-0053).

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/567,740. Although the conflicting

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claims are not identical, they are not patentably distinct from each other because the instant claim is drawn to a gel composition containing carbon nanotube and ionic liquid and while copending application is drawn to a conductor material containing similar composition carbon nanotube in ionic liquid, and the conductive nature of the copending composition in the instant composition would be obvious because they are drawn to similar compositions and because of conductive nature of carbon nanotubes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 8.30-6.00 Mon-Thu, 8.30-5.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on 571-272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KMV  
April 10, 2007.



Patent Examiner